

CAREX LIVIDA AND C. GRAYANA.

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ONE of the neatest sedges of northern bogs is the very glaucous or almost white plant known as *Carex livida* (Wahlenb.) Willd. In North America this species has its greatest development in Newfoundland and the cooler regions of Canada, and southward it is decidedly local: a single station each in marly bogs of Aroostook Co., Maine, Addison Co., Vermont and Essex Co., Massachusetts (with a tradition of a station in Berkshire Co.¹); more extensive areas in north-central New York, the New Jersey Pine Barrens and in northern Michigan; and a local colony in Mendocino Co., California. In Eurasia it is confined to Scandinavia and Russia.

As it occurs throughout most of its range *Carex livida* has rather stiff culms up to 4.5 dm. high, with the staminate spike 1.5–2.5 cm. long and borne usually on an elongate peduncle; the 1 or 2 pistillate spikes subapproximate, the lower only very exceptionally on a capillary basal peduncle; and the thick-fusiform to rhomboid perigynia 3.2–4.6 mm. long and tapering to an acute or subacute conical tip. This is the plant most often collected and known as *C. livida* and we find it well described by such specialists on *Carex* as Kükenthal and Mackenzie, the former saying "Utriculi . . . 3½–4 mm. longi . . . in stipitem conspicuum contracti, apice integro acuti,"² the latter, "perigynia 3.75 mm. long . . . narrowed and pointed but not beaked at apex."³ The plant answering these specifications is one of the dominant sedges of wet bogs and tundra of Newfoundland; but on the south side of the Straits of Belle Isle, in Newfoundland, in the region where so many relics of a more ancient flora occur, there is a little plant at once suggesting *C. livida* and occurring in similar habitats, but with low stature (down to 0.5 dm. high), the lower spikes mostly on capillary basal peduncles, the staminate spike only 0.7–1.5 cm. long and short-peduncled, and the perigynia only 2.2–3.2 mm. long and rounded at summit much as in *C. aurea*.

Search in the Gray Herbarium reveals plants with similar characters (though some of them of taller stature) only from Lapland and adjacent regions of Scandinavia and from the Canadian Rocky Mountains.

¹ Becket acc. to Dewey, Am. Journ. Sci. x. 42 (1826) and xli. 329 (1866).

² Kükenthal in Engler, Pflanzenr. iv²⁰: 510 (1909).

³ Mackenzie in Abrams, Ill. Fl. i. 322 (1923).

All the sheets seen from the latter region have the short round-topped perigynia and short staminate spike and at least one specimen on each sheet shows the long capillary basal peduncle, but some Lapland specimens, although having short perigynia and short staminate spikes show a definite transition in the form of the perigynia to that of the plant which is generally called *C. livida*, the plant which Chester Dewey in 1834 so beautifully described as *C. Grayana*, "Found in 1832 in a sphagnous swamp, near Utica, N. Y., by Dr. A. Gray, an active botanist."¹ When he published *C. Grayana* Dewey said, "It is a beautiful species, and has a remote resemblance to *C. livida*, Wahl., which grows two or three inches high in the marshes of Lapland"; but in 1835 Gray, himself, reduced *C. Grayana* outright to *C. livida*, saying: "My specimens agree in every respect with an European specimen of *C. livida* in the herbarium of the late Rev. Mr. Schweinitz; but I have never noticed the distant or subradical peduncles, as in Schkuhr's figure."² Dewey promptly accepted Gray's decision and in his *Index to Species* which closed his long series on *Caricography* he cited it³ only as a synonym of *C. livida*.

In view of the discovery in northwestern Newfoundland of the little plant with short round-topped perigynia, short staminate spike and remote subradical peduncles, a plant matched in its technical points by specimens from Lapland and from the Canadian Rocky Mountains (a very characteristic and frequent range) Wahlenberg's original description of *C. limosa* δ . *C. livida* at once becomes illuminating:

" δ . *C. livida*: spicis subbreviter pedunculatis paucifloris, bracteis amplexantibus foliaceis infima remotissima . . . capsulis ovato-suboblongis triquetro-depressis obtusiusculis . . . *Hab.* in paludibus ad fontes sylvestres Lapponiae Enontekensis."⁴

Furthermore, Willdenow, who raised Wahlenberg's variety to specific rank, gave a description perfectly applicable to the little plant of northwestern Newfoundland:

"*CAREX livida*.

C. spica mascula solitaria, foemineis binis subsexfloris, superiore incluse pedunculata, inferiore subradicali pedunculata, stigmatibus tribus, fructibus oblongis triquetris utrinque angustatis obtusis squamam oblongam aequantibus."⁵

¹ Dewey, Am. Journ. Sci. xxv. 141, t. S. fig. 59 (1834).

² Gray, Ann. Lyc. N. Y. iii. 234 (1835).

³ Dewey, Am. Journ. Sci. xlii. 330 (1866).

⁴ Wahlenb. Vet.-Akad. Nya Handl. Stockholm, xxiv. 162 (1803).

⁵ Willd. Sp. Pl. iv. 285 (1805).

Schkuhr's figure¹ of *C. livida*, although crude, shows a plant with remote subradical pistillate spikes and short staminate spikes, but the perigynia are shown as transitional in form between the most extreme plant with round-tipped perigynia and the more generally known *C. Grayana*. Kükenthal (*l. c.*), citing Schkuhr's figure, characterizes it as "mala!" As an illustration of *C. Grayana*, which Kükenthal describes as *C. livida*, it is certainly poor; as an illustration of the rarer plant, which seems to be what Wahlenberg and Willdenow first had, it is not so bad. It was drawn from very immature material with the anthers and the stigmas intact and the perigynia not yet distended. In this connection Asa Gray's comment, when reducing to *C. livida* Dewey's *C. Grayana*, is interesting: "but I have never noticed the distant or subradical peduncles, as in Schkuhr's figure." *C. Grayana* very rarely does produce remote subradical long peduncles (*C. livida*, var. *radicalis* Paine²) but plants with such basal peduncles are exceptional individuals and in no wise a true geographic variety. It seems, however, that *Carex Grayana* should be revived as a well defined variety of *C. livida*.

Carex livida and its extreme variation, *C. Grayana*, have the terminal spike strictly staminate or in very rare individuals with a few pistillate flowers at base. Somewhat west of the region where true *C. livida* was found in northern Newfoundland, Messrs. Long, Wiegand and I got another plant which in habit, pale foliage, short round-tipped minutely papillose perigynia and 3 stigmas is typical *C. livida*, but with the terminal spikes uniformly gynaeceandrous, so that the plant strongly suggests *C. rufina* Drejer, a rare species of Scandinavia and Greenland. *C. rufina* and its close relative, *C. bicolor* All., which is frequent in northwestern Newfoundland, both have 2 instead of 3 stigmas and the strange plant of the barrens at Four-Mile Cove cannot be put with them. Differing from *C. livida* only in having the terminal spike gynaeceandrous, it is probably best treated as an extreme variety of that species. The *Carices* with gynaeceandrous terminal spikes are, however, generally so constant in this character that, when this plant is secured in mature condition, it may well prove to merit recognition as a species.

The variations of *Carex livida* here discussed may be summarized as follows.

¹ Schkuhr, Riedgr. ii. 58, t. Ssss, fig. 211 (1806).

² Paine, 18th Ann. Rep. N. Y. State Cabinet, 159 (1865).

CAREX LIVIDA (Wahlenb.) Willd., var. **typica**. *C. limosa* δ . *C. livida* Wahlenb. Vet.-Akad. Nya. Handl. Stockholm, xxiv. 162 (1803). *C. livida* (Wahlenb.) Willd. Sp. Pl. iv. 285 (1805); Schkuhr, Riedgr. ii. 58, t. Ssss, fig. 211 (1806).—Culms 0.5–3 dm. high: lower spike often remote, subradical and on a capillary peduncle: terminal spike staminate, 0.7–1.5 cm. long: perigynia 2.2–3.2 mm. long, rounded or obtuse at summit.—Lapland and adjacent northern Scandinavia; northwestern Newfoundland; southern Alberta. The following are characteristic American specimens. NEWFOUNDLAND: turfy limestone barrens, northern half of Burnt Cape, Pistolet Bay, *Fernald, Wiegand, Pease, Long, Griscom, Gilbert & Hotchkiss*, no. 27,672. ALBERTA: bog, Lake Louise, *Brainerd*, no. 102; Banff, *J. Macoun*, no. 7444; Laggan, *J. Macoun*, no. 64,154.

Var. **Grayana** (Dewey), n. comb. *C. Grayana* Dewey, Am. Journ. Sci. xxv. 141, t. S, fig. 59 (1834). *C. livida* of most authors.—Culms 1.5–4.5 dm. high, rarely with basal spikes: terminal spike staminate, 1.5–2.5 cm. long: perigynia 3.2–4.6 mm. long, thick-fusiform to rhomboid, tapering above to an acute or slenderly-conical summit,—Scandinavia and Russia; Straits of Belle Isle, Labrador to Alaska, s. to Newfoundland (common), the Magdalen Islands, southern Aroostook Co., Maine (Crystal), Addison Co., Vermont (Bristol), Essex Co. (Boxford) and Berkshire Co. (Becket), Massachusetts, north-central New York (Herkimer Co. to Monroe Co.), Pine Barrens of New Jersey, northern Michigan and Mendocino Co., California.

I am fully aware of *C. livida*, var. *radicalis* Paine, 18th Ann. Rep. N. Y. State Cabinet, 159 (1865), but that is only a very exceptional departure from the widespread var. *Grayana*, its own author specifically stating that "Specimens of this variety are very scarce, perhaps two or three occurring in a hundred of the regular species." To take up for *C. Grayana* the name *C. livida*, var. *radicalis* would lead only to confusion.

Var. **rufinaeformis**, n. var., var. *typicam* simulans; differt spica superiori gynaeandra.—NEWFOUNDLAND: wet muddy hollow in limestone gravel-barren, Four-Mile Cove, Straits of Belle Isle, July 20, 1925, *Fernald, Wiegand & Long*, no. 27,673 (TYPE in Gray Herb.).

GRAY HERBARIUM.